Unit 5 - Week 3

Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-19, 23:59 IST.

1) Consider a undirected graph G with vertices $\{A, B, C, D, E\}$. In graph G, every edge has distinct weight. Edge CD is edge with minimum weight and edge AB is edge with maximum weight. Then, which of the following is false? *1 point*

- Every minimum spanning tree of G must contain CD
- If AB is in a minimum spanning tree, then its removal must disconnect G
- No minimum spanning tree contains AB
- G has a unique minimum spanning tree

No, the answer is incorrect.
Score: 0
Accepted Answers:
No minimum spanning tree contains AB

2) Let $G = (V, E)$ be an undirected and connected graph. If G has a cycle with unique heaviest edge e, then e cannot part of any MST. *1 point*

- True
- False

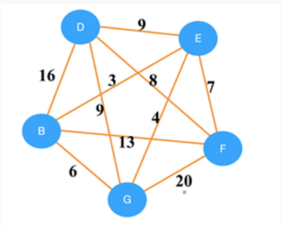
No, the answer is incorrect.
Score: 0
Accepted Answers:
True

3) There exist a tree with vertex degrees $d_1, d_2, \ldots, d_n$ iff $\sum_{i=1}^{n} d_i$ equals *1 point*

- $2n - 2$
- $2n$
- $2n - 1$
- n

No, the answer is incorrect.
Score: 0
Accepted Answers:
$2n - 2$

4) Which of the following edges form minimum spanning tree on the graph using Kruskals algorithm? *1 point*



- $(B, E), (G, E), (E, F), (D, F)$
- $(B, E), (G, E), (E, F), (B, G), (D, F)$
- $(B, E), (G, E), (E, F), (D, E)$
- $(B, E), (G, E), (E, F), (D, F), (D, G)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$(B, E), (G, E), (E, F), (D, F)$

5) Consider a reversed Kruskal algorithm for computing a MST. Initialize T to be the set of all edges in the graph. Now consider edges from largest to smallest cost. For each edge, delete it from T if that edge belong to a cycle in T. Assuming all the edge costs are distinct, does this new algorithm correctly compute a MST? *1 point*

- Yes
- No

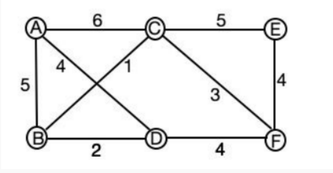
No, the answer is incorrect.
Score: 0
Accepted Answers:
Yes

6) Let G be a connected graph with n vertices and m edges, and positive edge costs that you may assume are all distinct. Let $T = (V, E')$ be a spanning tree of G. We define the bottleneck edge of T to be the edge of T with the greatest cost. A spanning tree T of G is a minimum bottleneck spanning tree if there is no spanning tree T' of G with a cheaper bottleneck edge. Is every bottleneck spanning tree of G a minimum spanning tree. *1 point*

- Yes
- No

No, the answer is incorrect.
Score: 0
Accepted Answers:
No

7) Run Prim's algorithm starting at E to find the minimum spanning tree of the graph shown below. *1 point*



The edge that will be added at the third iteration of Prim's algorithm is

- FC
- DA
- CB
- EF

No, the answer is incorrect.
Score: 0
Accepted Answers:
CB

8) Run Prim's algorithm starting at E to find the minimum spanning tree of the graph shown in Question 7. The edge that will be added at the 5th iteration of Prim's algorithm is *1 point*

- FC
- DA
- CB
- EF

No, the answer is incorrect.
Score: 0
Accepted Answers:
DA